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BARC NEWS



**Monthly Newsletter of the
Ballarat Amateur Radio Group**

8/10 02

Ballarat Amateur Radio Group

VK3BML

P.O. BOX 216E
BALLARAT EAST, VICTORIA, 3350

COMMITTEE 1981/82

POSITION	NAME	CALLSIGN	TEL(H)	TEL(W)
PRESIDENT	DICK ANTOSIEWICZ	VK3VSE/XCV	323273	321818
VICE PRESIDENT	ERNIE TURNER	VK3DET	326964	370375
SECRETARY	HENRY MORITZ	VK3VMO	327569	301800
ASS. SECRETARY	DICK FORRESTER	VK3VU	357663	391005
TREASURER	KEITH GRADY	VK3NWN	327016	370271
TECH OFFICER	PHIL SEDDON	VK3AQM	315220	313166
QSL/AWD MGR	MAURIE BATT	VK3-13062	422245	*****
PUBLICITY	GEORGE LANCE	VK3DS	323226	*****
EDUCATION	JIM HUMPHREYS	VK3ANH	321613	321719
NEWSLETTER	OLEM JARVIS	VK3YDI	314179	321951
COMMITTEE	BILL JOHNSON	VK3VYP	*****	SKIPTON 22
COMMITTEE	IAN COLLIER	VK3EQC	358989	358067
COMMITTEE	GEORGE FOWLER	VK3VEI	326863	391954
COMMITTEE	HANK HILVERTS	VK3NIA	393332	*****

THE BALLARAT AMATEUR RADIO GROUP MEETS ON THE LAST FRIDAY OF EACH MONTH AT 7.30pm. THE MEETINGS ARE HELD AT THE BALLARAT EDUCATION CENTRE IN HOPETOUN ST BALLARAT 3350.

REGISTERED BY AUSTRALIA POST-PUBLICATION No. VBH3397

THE editorial for the month of October.

Well two good things in store for me this month. First but not least a birthday and secondly something we can all share, (if you would like to send the editor a letter for his birthday and the magazine you could share that event too I guess), the annual end of October junk sale. I arrived at last years sale completely broke and had to buy everything on credit. That was not a good idea as I was still paying the debts off years (well months anyway) later. Again I broke with tradition or circumstance or whatever and actually used something that was purchased - where will it end?

As yet I have not had a report from the clubrooms committee. The editorial for once is being prepared early in the month so a report may arrive in time to reach the presses so to speak. The BARG informer No1 has heard the topic being discussed however as to date no reports, ideas, statements, comments or whatever have been presented for publication.

No news on the repeater either. If no news is good news all must be well in hand. Something will be happening soon is the rumour. Channel 8 at Geelong is up and away after a long absence and appears to be going well.

Should the club support the establishment of a U.H.F. C.B. repeater? Again I have heard the concept mentioned. What do you think? Do you dare put a pen to that flat white stuff and post it to the editor?

It is nearly field day time again, (well almost time to start planning), an event which should prove excellent experience and P.R. Last years was so exciting the aeriels fell down, and next years should be better. If you attended last years (this years) and have any constructive comments or ideas let us all know via this great print media format.....your voice to the Ballarat amateur community.

For those interested in computing the Ballarat Computer Club is attempting to reform. They have or will be meeting on Thursday nights at the Education Centre. I don't know much about the program or any contact person from which more exact information could be gleaned. Does anyone?

Entries in the "Phantom Development Award" have somewhat slowed. Does anyone accept the challenge? Where will it end? Will it end or even start? What is the phantom development award anyway? Where will your entry be on the fateful day? Where will you be? Will these questions be answered?

Can you read this? And her "small print" edition of the magazine is being contemplated for this month. If you have and there is undoubtedly some people who do have trouble reading the small copy let me know and you will be sent a full size copy. The small size was intended to save trees and club funds however subscribers appreciate being able to read their magazine, or do they? drop me a line and let me know what you think of the material, what you would like to see emphasised or if you would appreciate a full-size edition.

Clem Jarvis
210 Humffray Street North.

FOR SALE ... FOR SALE ... FOR SALE ... FOR SALE ... FOR SALE ...

One only NATIONAL PANASONIC model RF 4900 b/ba 10 band communication Rx. The frequency range is 525kHz to 30MHz plus f.m. b/cast. A service manual is included in the price of this Rx. which is designed to work from 240vac or 12vdc. Price \$460 neg. Contact Barry Magee Phone 395759 (H).

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BALLARAT COMPUTER GROUP.

Some information has arrived regarding the above group. They will attempt to meet once a month. The focus of each meeting will be the demonstration of a particular computer or two. There will be a chance to discuss computer type projects and problems of interest. The next meeting will be held at the Education center at 7.30pm on Thursday the 5th of November. An Apple 2 will be on display. Please direct enquiries to Rob Ward Ph. 301524.

NEXT MEETING - Ed. Centre Hopetoun Street 5th November.

PRODUCT REPORT.....PRODUCT REPORT.....PRODUCT REPORT.....PRODUC

This month the Phantom Presents.....

CALIBRATOR, CRYSTAL No 10. (Complete kit with spare valves etc.)

This kit is available from Wendouree Disposals for \$6.50. It comes in a handy carry pack cardboard type box which is covered in dozens of Army type stamps, stickers, labels and scrawlings. Upon opening the box you are faced with the following...one grease covered dark green metallic box, a copy of "Working Instructions" - makes very funny reading in places, produced by the War Office, Whitehall 1947, a smaller cardboard box (with stamps, stickers etc.) and a couple of rubber connecting leads.

Further investigation of the contents revealed the following. The dark green metallic grease covered box although cleverly disguised as a wave meter represents a very amateur attempt by the English to smuggle grease into Australia. There was more grease on the inside. Now grease has its place tractors and things like that grease also sticks to everything I found that during the modification process that followed hands had to be washed every five minutes. The unit itself has been contained to four valves which were replaced quite easily by fetts which were soldered neatly onto the underneath of the valve sockets. (one of the valves was completely irrelevant to the operation so only three fetts were needed). One fet operates as a 500KHz xtal controlled oscillator, another as a 250kHz - 500kHz variable frequency oscillator while the other is a mixer/buffer/output. The controls give you the choice of operating the xtal osc or the crystal osc plus the VFO. The dial calibrations are unreal. While the book claims you can use the calibrator to set a receiver on any frequency between 500kHz and 30MHz I defy anyone to follow the instructions or relate the dial markings to an actual frequency. (So many howls and whistles come out of the receiver there may be an application for the unit on public displays, or perhaps field day competitions - shot put variations.

SUMMARY - An interesting unit, of no use as a boat anchor due to all the grease, perhaps if painted bright colour a marker float. The 500kHz rock may be useful? If you are keen enough to own a R40 Rx this calibrator would make an interesting, colourful accessory that will impress visitors and increase resale value. Keep it tied to the Rx with a long length of string - if the receiver sinks at least you will know where it went down!

WANTED TO COPY Owners manual for late model Yaesu FT 101.

Clem jarvis 314179 (ah) 321951 (w).

HAMILTON CONVENTION

DON'T FORGET THE HAMILTON (W.I.A.WESTERN ZONE) CONVENTION
ON THE WEEKEND OF 31 Oct/ 1 Nov.

If you want accomodation you HAVE to book in OK?

ENTRY FORMS AVAILABLE FROM YOUR PRESIDENT AT THE MEETING

GEEELONG AMATEUR RADIO CLUB

The G.A.R.C. has invited all B.A.R.G. members to their annual
Christmas picnic to be held at 'Angahook National Park' just near
Aireys Inlet. It will be held on Sunday November 22nd. If you want
any details then see Dick VK3VU

PHANTOM

THE GREAT ~~80Mx~~ 80 Mx DX CONTEST

At the instigation of ~~PHANTOM~~ the President Dick VSE/XCV
has donated a prize (at this stage a secret) to be presented
at the next A.G.M. The prize will be awarded to the station
who has the best DX contact using CW, Now before everybody goes
cranky please read the rules as set out below. I think you will
find the contest a lot of fun and who knows we all may learn
something.

RULES

- (1) The transmitter receiver shall be built from a valve type
black and white television. A mininum of additional parts
may be used. (An independant judge will decide on what a
'minimum additional part' is.)
- (2) CW only will be used.
- (3) The competition will be run on the 80Mx band only
- (4) QSL cards need not be submitted.
- (5) The final judging will take into consideration the miles/watt
of the contact. The miles (or KM) will be taken on a great
circle bearing (or as near as practicable)
- (6) The contest shall be run in the true spirit of Amateur Radio.

REMEMBER Contestants make for good contests so join in and have
some fun. I hear the prize is really worthwhile.....

P 3. The contest is open to B.A.R.G. members y.

PHANTOM DEVELOPMENT AWARD

(4)

ELECTRONIC MORSE CODE KEYER, Dick Smith. Variable speed, tone and volume control. Perfect working order. Nokey \$40.
DIGITAL FREQUENCY CENTER including prescaler for VHF, case etc. As described in Electronics Australia, March 77, p. 30. Almost complete and all parts included. \$60.
DATONG MULTIMODE HIGH PERFORMANCE FILTER FL-2. Has seen very little use, new price \$250 asking \$200.
FRG-7 YAESU COMMUNICATIONS RECEIVER. Slow fine tuning fitted. Immaculate condition \$230.
MORSE CODE PRACTICE OSCILLATOR. (no key) 9volt battery operated, tone and volume controls. \$12.
A.C. digital ham clock, Dick Smith. Provision for outside switch, alarm etc \$12.
SONY ICF -2001 FM/AM/SW/SSB RECEIVER. PLL synthesized, micro-computer controlled, up-down scanning, 6 station memory etc \$220.

CONTACT - Henry, VK3VMO 327569 a.h.



FOR SALE - ICOM IC &)+ (thats 701 in uppercase). Purchased April last year and has seen little use. Has PSU, mic, cables, handbook etc \$900. Churnside trap vertical - 80 - 10 metres. Complete with radial traps goes well \$70.

CONTACT - Arthur Solomon. VK3LJ ph.452031.

INFORMATION WANTED = Does anyone have any information on a Bendix
TA-2J-24? If you do please let me know.

Clem Jarvis 321951 b.h. 314179 a.h.

Do you want to buy sell or exchange? Place your adds with BARG News. Contact Dick or Clem or leave details addressed to Kevin Huges (Hughes) at the Regent theatre if you walk about that part of town. There is also plenty of space for news and shnipits so keep them rolling in.

A SMALL SPACE FOR A SMALL CONTRIBUTION. IF YOUR DAY HAS A
FEW MINUTES TO SPARE FIND SOMETHING OF INTEREST AND DROP
ME A LINE. THANKS TO THOSE WHO HAVE SENT INFORMATION AND IDEAS.

To b.a.r.g. news

C/- Clem Jarvis

210 Humphrey St. North

BALLARAT. 3350.

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MINUTES OF THE MEETING OF THE B.A.R.G., 25th September 1981

Meeting was opened by Pres. Dick XCV at 7.45 pm with about 25 members and visitors in attendance. Apologies were sent by Barry Magee, Gordon Lee and Kev Hughes (with VU being late). MINUTES of the last meeting were read and accepted (DWJ/NIA). BUSINESS ARISING FROM THE MINUTES: N.O.N.E. (it does happen!)

CORRESPONDENCE: Out: Letter to WIA via B. Stares, to propose a western district award of some kind, to be managed by BARG. b) Also letter to Mrs Gray, to offer club assistance with sorting of outstanding QSL mail. To both letters, no response has been received to date.

INWARDS: GARG newsletter; an invitation to the WIA Hamilton western zone convention; WIA membership application for club affiliation; several award applications. (VEI/PAF)

TREAS. REPORT:

Without going into the fine print, finances of the club are in good shape, with \$1050 now invested at VS&L and no outstanding debts. A further donation of \$100 had been received for sale of DXW awards and also \$20 from DWJ for help received from various members toward his BIG ticket. (good on yer, Bill!) (George DS/Dick VU)

QSL AND AWARDS:

Maurie reports no cards received last month (again) and that we are about 1000 cards down on a similar period last year. They must be piling up high, somewhere. 2 more begonia awards issued plus 28 DXW awards, -keep 'em coming, Maurie! Cliff PAF then spoke about the local thursday net and the slack response received from local amateurs so far. Well, its time we did our bit, fellers. Drop in sometime soon. Incoming calls were received from all states and ZL, so the net must be getting some attention on air.

(George VEI/Ernie DET)

PUBLICITY: No big deals this time. Henry VMO finally finished the long awaited Ballarat/US awards for distribution hot off the presses and the only happy face about it at the meeting was ol' Clarrie VEZ who now can sleep in peace again. Dick VU asked George DS to arrange for details about the club to be included in the forthcoming Courier Citizen's guide, -thy will be done.

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05

EDUCATION: Slow but steady progress being made with the novice course and some drop-outs thinning the ranks. Other than that, all looks reasonably hopeful.

TECH. REPORT: Phil AQM couldn't make it to the meeting, but Dick VU stated that the repeater showed no marked desensitization when tested while it was up and going. Further tests and slight mods have still to be done.

NEWSLETTER: The "Image" of the traditional newsletter is undergoing a gradual change, as if you hadn't noticed. In time, it will be even better, once the bugs are taken out of the current format and we even may be able to read it without getting a crick in the neck, hi.

GENERAL BUSINESS: Dick ACV reminded all and sundry about the auction and junk sale next meeting, - so keep cleaning out those unwanted items and pack up your troubles and flog them to some other unsuspecting guy, chaps.

Meanwhile, a rather breathless Dick VU had arrived and proceeded to distribute to members the brand new, revised and exhaustively discussed (at the earlier committee meeting) constitution. Copies were given to all present members for perusal and comments at the November meeting. Brian ZBS reminded members also of the coming western zone convention and urged participation; applications were made available for interested parties.

Note was also made of a new WIA booklet containing the latest regs concerning CB regulations newly introduced. Brian also mentioned that a coordinator for the WIA western zone net (every WED, 3 PM, on 3560 $\pm$) was needed and support was urgently needed to make it work. FINALLY: Henry VMO gave a brief "mini lecture" on the subject of "WORKING THE JAs and their awards". Maybe it set SOME people thinking, I hope.

MEETING FINISHED (officially) at 3.20 - a new club record.

Oh yes, I almost forgot (silly me): Dick VU also gave recognition to all those fortunate ones who recently had achieved success at the exams and are sporting their brand new call signs - proudest of them all (just ask him) a feller who now is called "DWJ" Congratulations, chaps!

70cm LOG PERIODIC

By Lewis Elmer. G8EUP

There is no doubt that the best all-round aerial for TV work is the multi element Yagi. It is however, not the only type which can be used. If gain is not a primary consideration then other types offer certain advantages; one such is the log-periodic aerial.

The log-periodic aerial consists of a number of half-wave dipoles whose lengths and the spacing between them decrease in a geometric progression. All elements are driven and are fed from a balanced feeder, the connection to adjacent elements being taken from alternate wires to maintain the correct phase. This is shown diagrammatically in Fig 1 which also indicates that the aerial is fed from the end having the shortest elements, and that the feeder terminates in a short circuit situated $1/8$ wavelength behind the longest element.

The main advantages of the log-periodic are:

- i) over the pass-band the gain and phase are constant.
- ii) the polar diagram shows no side lobes.
- iii) the front to back ratio is high.

The log-periodic aerial is normally used in wide band designs but there is no reason why a narrow band version can not be constructed. The design given here uses 10 elements to cover the 432 to 440 MHz amateur TV band and, with care, can be made to give a gain of over 10dBd.

The balanced line feeding the dipoles is also the supporting boom and consists of two lengths of 15mm square aluminium tube separated by a 3.5mm thick aluminium spacer placed $1/8$ of a wavelength behind the longest element, and a 3.6mm thick polythene spacer placed between the 9th and 10th elements. The aluminium spacer also acts as the line terminator and the polythene spacer must be fixed with a nylon screw.

The lengths and spacing of the elements are given in table 1. The element length is the distance from the boom to the element tip. The dimensions are given to 0.1mm which may seem to be more accurate than is necessary, however, to get the best out of any aerial it is necessary to be accurate in your work. Aerials just do not have the 'convenient' dimensions that some books give.

The elements themselves are made from $1/8$ " diameter aluminium rod, and are arranged to project on alternate sides of the booms as shown in Fig 2.

They should be cut longer than necessary initially and then filed to the exact length after they have been fixed to the boom. Various methods of fixing are possible; They could be welded (not to be recommended to the inexperienced since aluminium melts very suddenly and the whole lot may collapse) or soldered with aluminium solder or, if the holes are made to give a tight fit, the elements can be secured by centre punching around the hole.

The aerial is fed at the short end using UR57 (75 ohm) coaxial cable as shown in Fig 3. The hole in the bottom of the lower boom is made big enough to take the full width of the cable. That in the top of the lower boom is drilled to allow the polythene inner to pass through and the hole in the bottom of the upper boom is drilled to take the centre conductor only. The centre conductor is then bent over inside the boom and a small metal plate 12mm x 20mm is placed on top of the wire and then secured with a wooden wedge.

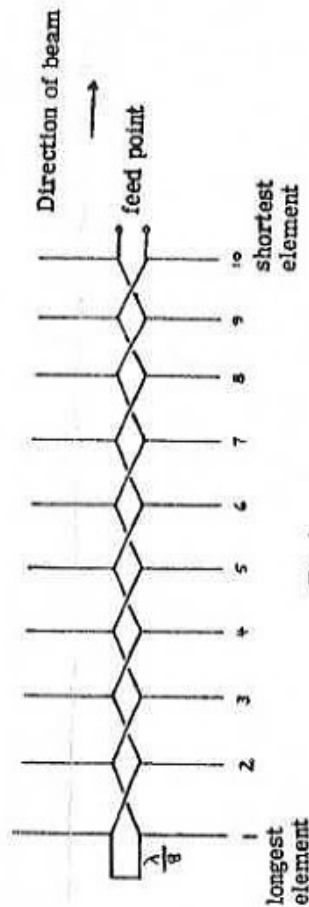


Fig 1

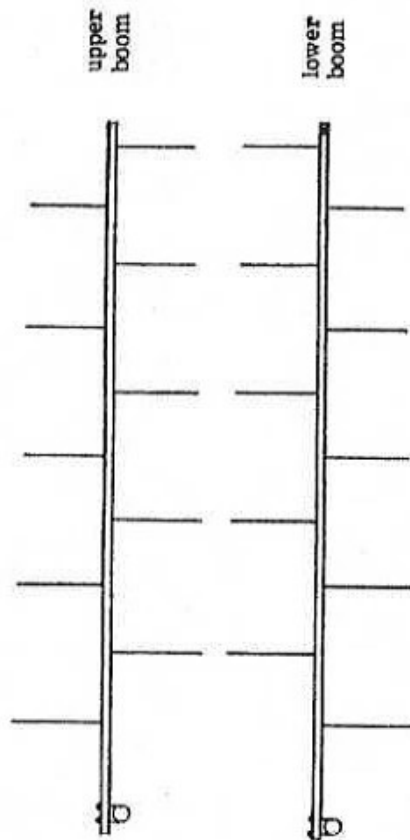


Fig 2

A similar plate with a hole in it to take the cable minus its outer polythene is also used inside the lower boom, the braiding is separated and a wedge driven in to secure it. The ends of the boom are then closed with a polythene bung. The cable is then taken back along the boom to the other end where the short circuit is situated and, since this is a point of zero voltage, if the outer braiding of the coaxial cable is fixed here then no currents will be allowed to flow in the outer, thus acting as a balanced to unbalanced connection.

SOURCES OF SUPPLY.

The 15mm square aluminium boom was obtained from a local TV aerial erection firm. The 1/8" diameter rod is actually uncoated welding rod 99.5% aluminium. This comes in 750mm lengths and is sold by weight, it is obtained from welding equipment suppliers. If the above materials cannot be obtained exactly then, provided the differences are not too great, the effects will be a slight shifting of the frequency band which will not be serious, however the impedance of the aerial will alter and some experimentation with the separation of the booms will be necessary to get the best SWR. The aerial is fixed to the mast with two exhaust pipe clamps obtainable from motor accessory shops. Make sure the clamps are long enough to go through the boom. Finally the area around the clamps and the coaxial feed point should be painted with clear polyurethane varnish to protect against moisture and corrosion.

reference

The design of log-periodic dipole antennas - Robert Carrel. IRE convention record Vol 9 part 1 1961 pages 61 to 75.

<u>ELEMENT No.</u>	<u>PROJECTION FROM BOOM</u>	<u>SEPERATION</u>	<u>COMULATIVE DISTANCE FROM EL' 1</u>
1	171.4mm		
2	167.9mm	129.9mm	129.9mm
3	164.5mm	127.3mm	257.1mm
4	161.2mm	124.7mm	381.1mm
5	158.0mm	122.2mm	504.0mm
6	154.8mm	119.8mm	623.8mm
7	151.6mm	117.4mm	741.2mm
8	148.6mm	115.0mm	856.2mm
9	145.6mm	112.7mm	969.0mm
10	142.6mm	110.5mm	1079.4mm

SHORT. 86.8mm behind element 1.
BOOM. 15mm square aluminium tube.
ELEMENTS. 1/8" (3.175mm) diameter aluminium rod.
BOOM SEPERATION. 3.5mm at element 1
3.6mm at element 10

TABLE 1

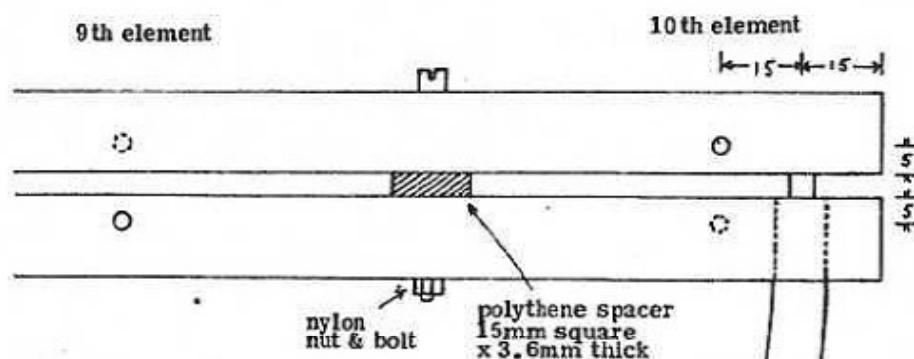


Fig 3

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There has been a great deal of activity from DX stations on the 20, 15, and 10 Mx bands. Fifteen has been particularly good with good sigs from all continents. Perhaps the biggest event (or non-event) of the month was the curtailed operation from San Felix Is (CEØX) by Bob KF10. The operation was restricted to about 48 Hrs and this included the work Bob had to do whilst on the island. He worked only about 600 stations. There are rumours rife of a further operation involving some Chilean amateurs but I'm afraid I will believe them when I hear activity from the Island.

Another station that has been active is TA2KS (Turkey) who has a QSL manager from G land. This will make it a lot easier to get Turkey confmd. His QSL manager is G3SCP. He has only a dipole and less than 100W so he is a little difficult to hear, but persistence pays off H1. FB8WG (Crozet) has been active but times erratic due to work commitments. His home call is F2CL and can be heard around the low end of the 20 Mx band (14.100-14.150) If he is not too busy he will happily go to CW. He will be on Crozet for about 1 year so I think everybody will have a chance to work him. His address is incorrect in the call book but I will give it in the QSL information in these notes. Another difficult country to show on 20 this month was D68AM

(Comoros). He regularly comes up on the 'Round-Table' net on 14.175 at about 5.30a.m. local time. Listen for Arnold VP2MH or Peter YO9WU. TR8BJ has been on 15 and 20 with very good signals. His QSL manager is DJ5DA.

Once again, could I ask for some contribution from operators and listeners who hear what's going on on the novice bands. It appears that we have nobody in the club who does. Many thanks to those who did help, Maurie Batt and Ernie VK3DET.

Whats around the bands

10 Mx BV2, A35, HS1, YJ8, TL8, FK, FO, 3D2, W, VE, XE, KH6, GM, GW, EI, HKØ, KG6, KX6.

15 Mx TL, TR8, ZS6, 9G, 9H, G, W, VE, VP2V, J3, V3 (ex VP1) TU2, CT2.

20 Mx TR, SU, 9H, A3, D6, 7Q7, VP2M, VP2A, CX, EL, KA2MI (Marcus Is), KH6 5X4, 9L1, A4X, HZ1, HB9, OY5, 8R1, J6, ZK1 (South Cooks), HK, PY.

If anybody has worked Neil A4XHZ and would like to meet him, he will be staying at this QTH on the weekend of the Hamilton convention. He will be going to Hamilton on the Sunday so if you would like to show him some good Ballarat Amateurs hospitality then pop around to this QTH on Saturday the 31st of October.

QSL INFORMATION

FB8WG	Georges de Marrez, Santa Severa, 20228	Luri, Isle of Corsica.
D68AM	via WB2OHD	FB8ZO via F6EYB
VP8AJL	via GM3ITN	VP2ET via VE1BNN
TR8BJ	via DJ5DA	KC6DC via WB6LED
		ZF1SB via N8AG
		VR6TC via W6HS
		A35ZZ via DJØFX

BARGAINS GALORE AT THE BARG AUCTION.....BARGAINS GALORE AT THE BARG AUCTION.....

Buy or sell anything, well almost anything at the next club meeting. Make it swing bring along something to sell. I realize that it is a problem for some people to part with anything....even I will try to find something that i could part with ~~for~~ with a minimum of tears.

Clem Jarvis.

Lowband DX.

160m.

This band came to life in the last few weeks with some quite strong DX signals, calls heard were:-

VK's, 1, 2, 3, 4, 5, 6, 7. DX, WØ.K7.W7.ZLI. 2, 3, 4. and a very weak YJ8.

80m.

ZK2EL. YSIPG. TI5EWL. FK8CR. FKØRR. YJ8RG. C2INI. AH2L. KL7AF. CEØZAD. CE3NR. LU9FFA. PY3TE. XEIJ. H44DX. VE6AWG. G3MUV/CEØ.

40m.

TG9AL. KH2L. EA8QL. UKØQAA. GI3OCR. CT2QN. LU5ELW. XEIJ. EI9EB. JA's. YJ8RG. YUINR. I2VRN. PY2TTY. PAØVSS. HK5CKH. GW4AX. F6CRC. OX3OX. HI8PGG. J78PP. LA7ZO. VE7WL. KH3HB. H44DX. G3ZEY. T3ØRF. TI2CCC. TF3DC. CTIUP. VU2YK. G3MUV/CEØ. PAØW AY/A6.

Outwards QSL Bureau.

Do not forget to secure your bundle of cards with a rubber band and place the address label off the envelope you receive your "AR" magazine under the rubber band. This is requested by the bureau, doing this proves that you are a member of the WIA.

DX Widows Award.

Applications for this award are not coming in as fast as they were in the past. I still have around 750 left so please mention it to your contacts, we may receive some feed-back from this.

Begonia Award.

Issued four awards in the last month, three of these going to New Zealand.

Maurie Batt.

from 'QRZ DX';

Living on this Earth is very expensive, but it does include a yearly free trip around the sun.....

Those coaxial connectors

The recent notes on soldering PL259 plugs to coaxial cable have indicated that this whole subject of rf connectors is still, for many of us, shrouded in some mystery. In *rf design* (September/October 1980), Allen Nemetz, of Amphenol, provides "A designer's guide to rf connector selection" that sheds a good deal of light on these useful, if at times infuriating, plugs and sockets. RF connectors have spawned a very large family since they were first developed in the 'thirties and forties for radar. While some of the article is concerned specifically with Amphenol devices, much of it is of general interest; as the following brief notes may indicate.

Currently there are three main categories of interest: those for use with standard cable, such as the "uhf" type including the PL259 plug and SO239 socket; the BNC miniature connectors; and the subminiature types (not in wide use by amateurs) such as the SMA series. However, there are quite a number of other varieties, including precision components used in some professional equipment.

The "uhf" series date from the earliest days as the first true coaxial connectors; even today the PL259 plugs are the most widely used coaxial connectors, with the cb industry having given them a fresh lease of life. The PL259 plug is designed for RG8-type cable, but two adaptors allow it to be used on RG58-type and RG59-type cables. Since soldering the centre contact of the PL259 is recognized by the industry as being by no means simple, Amphenol have adopted a "field crimp concept" to eliminate any need for soldering. These devices have a peak voltage rating of 500V and are recognized as not being weatherproof. It should be appreciated that these connectors were originally designed before there was any recognized requirement to maintain the impedance accurately through the connection; they are "nominally" 50Ω but perform satisfactorily on both 50 and 70Ω cables up to 500MHz with low vswr. It should be appreciated that it is not until a small impedance variation approaches one-fiftieth of a wavelength that the signal begins to "see" the discontinuity.

The N series of connectors are credited to Paul Neill at Bell Laboratories during the second world war. Unlike the "uhf" series these have screw threads. The early N-series connectors were also suitable for use only up to about 500MHz, but major improvements were introduced later, and modern N-series connectors are suitable for use up to 11GHz with constant 50Ω impedance. These connectors are quite widely used in professional communications equipment. An N-series connector can be used with 70Ω cables at frequencies below about 300MHz.

A C-series connector (the "C" came from Carl Concelman) is a constant 50Ω unit basically similar to the N series but with a bayonet lock and able to handle more power.

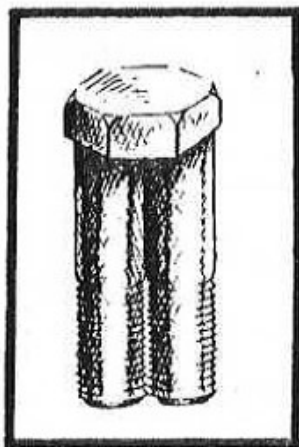
The most popular connector for "miniature" cables is the BNC series (the BNC is said to stand for Bayonet-Neill-Concelman). These can be used with such cables as RG58/U, RG59/U and RG62/U. They are currently made in forms suitable for several cable affixment styles such as crimp, clamp and solder. Modern BNC connectors can be used up to about 4GHz, although early ones were meant for use only up to about 300MHz. The TNC series is a threaded version of the BNC.

Of the other types, SMA are semi-precision subminiature connectors made in several versions, for use from dc to 18GHz; they are less costly than the true "precision" types, some of which are now capable of resonance-free performance up to 34GHz. Because cost rises pretty sharply for such characteristics, it will usually be found wise not to overspecify requirements. It will also be seen from these notes that important variations exist within the same "family" depending on when they were manufactured and whether they are meant to be soldered or crimped to the cable.

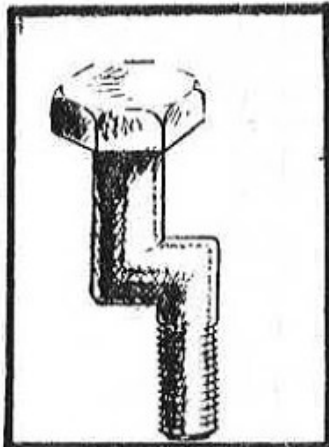
club membership

Full calls	20
Novice calls	17
Limited calls	4
Novice/Limited calls	7
SWL's	10
Total	58

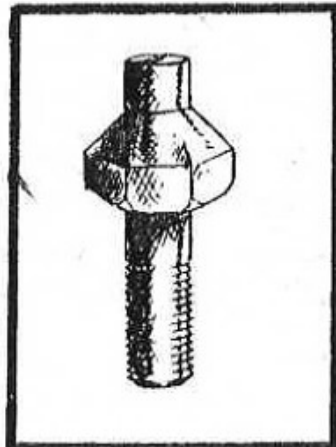
SOME HANDY HINTS FOR YOUR 80Mx TRANSCEIVER



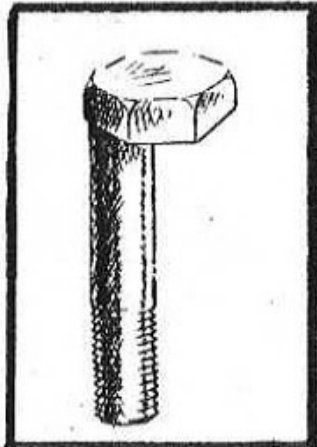
Bishankel bolt for double drilled holes.



For mis-matched holes.



For holes that are countersunk on the wrong side.



For holes too close to the edge.

Earth Stations: Sky in the Pie

Big dishes bring satellite programming right into the backyard

No mistaking them. Some look like a cake mold capable of turning out angel food for 2,500. Others look like a louvered back door from a tract house in Brobdignag, or a creature from a 1950s horror movie—the wretched spawn of reckless radioactive experimentation, the amazing colossal sand dollar.

Don't be fooled. The scooped-out gimcrack is nothing more than a TV antenna. It is quite a bit more, however, than the rabbit-ears atop the family console.

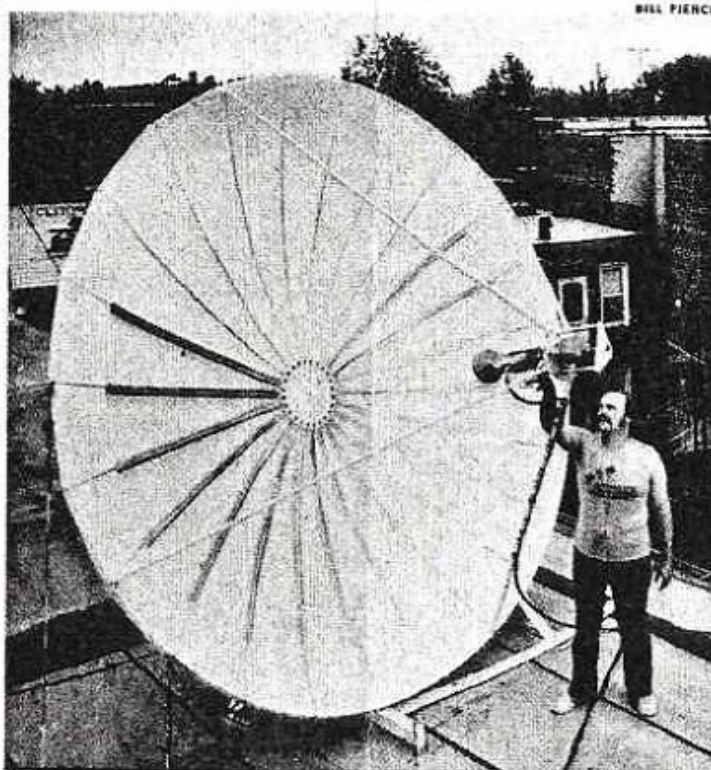
While the rest of the neighborhood wonders when it will be wired for cable and settles down for another dose of network gruel, the weird piece of machinery across the way is pulling down programs from at least three pay-TV companies. Plus "feeds" from network correspondents hours before the evening news gets on the air. Plus NASA transmissions of pictures from Saturn. Plus soccer from Brazil. Plus the glorious miscellany of perhaps 50 to 60 programs a day, from closed-circuit prizefights to S.R.O. symphony concerts that are beamed off whichever satellite is being tuned in.

In the jargon of the video revolution, this exotic antenna and its associated electronics are called an earth station, and the price is just as fancy as the name: from \$3,500 to \$14,000 for a good unit. The high tab is for high tech. An earth station pulls in a signal from one of the twelve U.S. and Canadian communication satellites beaming down from a fixed position 22,300 miles above the equator—what vid-whizzes call a "geosynchronous orbit." The signal is focused into an amplifier, which magnifies it up to 100,000 times before it is converted to a conventional TV signal.

There are estimated to be anywhere from 10,000 to 20,000 earth stations in operation. "There will probably be 10,000 more of these things sold next year," enthuses Dave Bondon, president of a Hightstown, N.J., electronics subsidiary that makes earth station antennas. Says Andy Hatfield, whose AVCOM company makes components for the station: "It's phenomenal. You see these pictures that came from Saturn and it's like being part of NASA. Watch an earth station: you'll never look at terrestrial televi gain."

Confirmed extraterrestrials are a diverse group. John Flynn, a hospital security guard who lives in Brooklyn, has a homemade job he built out of a handbook and \$7,500 worth of parts. Record and Movie Producer Lou Adler has a rather more elaborate installation out in Malibu. Heavyweight Champ Larry Holmes has one at his digs in Easton, Pa.

Although video freaks may think of themselves as space-age ham operators, innocently tuning in on whatever signals bounce about in the ether, satellite pro-



On his Brooklyn rooftop, John Flynn tries out deep-dish communication. Pictures from NASA, soccer from Brazil, "feeds" from network news.

grammers consider them electronic buccaners and mutter darkly about "tapping," "free-lunching" and "unauthorized reception." Among the toughest in its stance has been Time Inc.'s Home Box Office, whose chief counsel, John Redpath, says the company is considering "all possible alternatives to stop" unofficial signal reception.

While programmers and cable outfits get hot under the corporate collar, earth station owners and suppliers profess little concern. They point out that the majority of earth station owners live well outside cable range and generally do not try to redistribute or sell the signal. Benson Begun, a vice president of the Warner Amex satellite operation, concedes that "we don't see the backyard individual receiver as a

significant economic threat. But the pirate who puts up an antenna on an apartment complex or a hotel is viewed as much more significant, and such people we are actively pursuing."

Satellite users could—and might—scramble the signals bouncing off the communications satellites and then unscramble them for cable subscribers. But FCC Staff Engineer Wilbert Nixon says such a process would represent "an expensive investment." Just now, there are probably not enough earth stations to justify a major legal or technological fuss, and confusion will probably continue to reign in the absence of a definitive court test.

There are strong indications, however, that the audience and the market for earth stations will continue to grow. Until 1979, the FCC required a construction permit for any earth station. Now a video freak with a fair amount of technical finesse can assemble one from a Heathkit for \$6,995, and students from Hall High School in Spring Valley, Ill., put together a fine version with a \$1,700 kitty and some Army surplus parts. At least 70 companies can now supply earth stations or various components for them. In Hailey, Idaho, a small outfit called Commtek Inc. publishes a monthly *SAT Guide* that furnishes up to 140 pages of listings to its 12,000 subscribers all over North America and the Caribbean.

The FCC is considering a modification of its spacing regulations so that there would be room for at least 20 new satellites in the next five years or so. The heavens could be full of satellites floating around like apples in a Halloween bobbing tub, and the *SAT Guide* may eventually get as

thick as the Manhattan Yellow Pages. More significant, the Communications Satellite Corp. (COMSAT) has submitted the first application to the FCC for permission to establish a direct broadcast system. By the mid-1980s, this system could conceivably be sending down three channels of pay programming into smaller (2½ ft. in diameter), cheaper (\$200-\$500) earth stations. Meanwhile, an RCA subsidiary, and several other firms, including CBS, have plans of their own to develop direct broadcast systems. All in all, prospects seem bright for many more people to join the folks in Brooklyn, Hall High School and Easton, Pa., on the satellite beam.

—By Jay Cocks. Reported by David S. Jackson, Washington and Gary Ruderman/Chicago, other U.S. bureaus

8/1/80